A CASE STUDY: JAVA IS SECURE PROGRAMMING LANGUAGE

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ABSTRACT

There are many reasons why Java is so popular and some of the reasons are javas' strongly supports features. These features have made Java the first application language of the World Wide Web. The main aim had to make java simple, portable and reliable.

KEYWORDS: Platform Independent, Object Oriented, Robust, Secure, Multi-Threading, Dynamic, High Performance

INTRODUCTION

The features of Java this torrent computer-speak jargon has often been labeled the "Oop" and was doubtless intended with tongue in cheek, it nevertheless accurately identifies many of the features of Java that they make it so well-suited for programming internet applications. Java History: Java is a general-purpose, object-oriented programming language developed by Sun Microsystems of USA in 1991.Originally called Oak by James Gosling (one of the inventor of the language). Java was invented for the development of software for consumer electronic devices like TVs, toasters, etc. The main aim had to make java simple, portable and reliable. Java is first programming language which is not attached with any particular hardware or operating system. Program developed in Java can be executed anywhere and on any system.
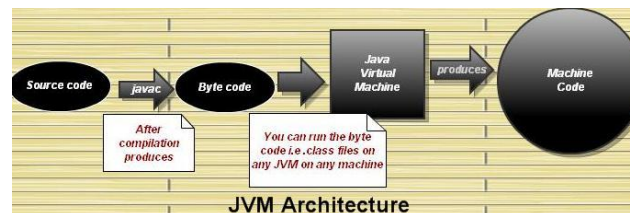

Figure 1

Features of Java are as follows:

- Compiled and Interpreted

- Platform Independent and portable

- Object- oriented

- Robust and secure

- Distributed

- Familiar, simple and small

- Multithreaded and Interactive

- High performance

- Dynamic and Extensible

Interpreted & Compiled

Basically a computer language is either compiled or interpreted. Java comes together both these approach thus making Java a two-stage system. One of the first advances, after the intention of the programs itself, was the of the program interpreter. Like the early short –code and speed code, Java is an interpreted language. This means the Java executable files are composed of so called byte codes that are instructions and data relating to a hypothetical computer called Java virtual machines.

Platform Independent

Java is Platform independent. The meaning of the platform here, in the computer industry it typically means some combination of hardware and system software. Java is compiled to an intermediate form called **Java byte-code** or simply byte code Java program never really executes immediately after compilation on the host machine. Rather, this special program called the Java interpreter or Java Virtual Machine reads the byte code, translates it into the corresponding host machine instructions and then executes the machine instruction. A Java program can run on any computer system for which a JVM (**Java Virtual Machine**) so Java is platform independent.

Object- Oriented and Portable

Java supports the feature portability. Java programs can be easily moved from one computer system to another and anywhere. Changes and upgrades in operating systems, processors and system resources will not force any alteration in Java programs. This is reason why Java has become a trendy language for programming on Internet which interconnects different kind of systems worldwide. Java certifies portability in two ways. First way is, Java compiler generates the byte code and that can be executed on any machine. Second way is, size of primitive data types are machine independent.

Robust and Secure

Java is a most strong language which provides many securities to make certain reliable code. It is design as garbage –collected language, which helps the programmers virtually from all memory management problems. Java also includes the concept of exception handling, which detain serious errors and reduces all kind of threat of crashing the system. Security is an important feature of Java and this is the strong reason that programmer use this language for programming on Internet. The absence of pointers in Java ensures that programs cannot get right of entry to memory location without proper approval
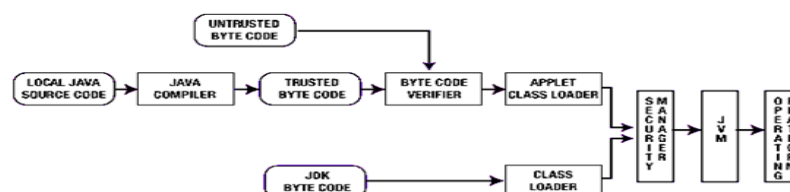
Figure 2: Java Security Model

As a matter of fact, Java is designed from the ground up for network-based computing, and security measures are an integral part of Java's design.

Distributed

Java is called as Distributed language for construct applications on networks which can contribute both data and programs. Java applications can open and access remote objects on Internet easily. That means multiple programmers at multiple remote locations to work together on single task.

Familiar, Simple and Small

According to Sun, Java language is simple because: syntax is based on C++ (so easier for programmers to learn it after C++). Removed many confusing and/or rarely-used features e.g., explicit pointers, operator overloading etc. No need to remove unreferenced objects because there is Automatic Garbage Collection in java.

Java is very small and simple language. Java does not use pointer and header files, go to statements, etc. It eliminates operator overloading and multiple inheritance.

Example:

Method overloading means method name will be same but each method should be different parameter list.

```
public class prg1

{

int x=5,y=10,z=0;

public void sum()

{

z=x+y;

System.out.println("Sum is "+z);

}

public void sum(int a,int b)

{

x=a;

y=b;

z=x+y;

System.out.println("Sum is "+z);

 }

public int sum(int a)

{

x=a;

z=x+y;

return z;

}

public static void main(String args[])

{
```

```
prg1 obj=new prg1();

obj.sum();

obj.sum(15,10);

System.out.println(+obj.sum(15));

}

}
```

Output :

sum is 15

sum is 25

25

High Performance

Java performance is very extraordinary for an interpreted language, majorly due to the use of intermediate byte code. Java architecture is also designed to reduce overheads during runtime. The incorporation of multithreading execution speed of the program. In Java first compile the program, and then execute it using the Java interpreter. In general, interpreters are slow, because an interpreter executes program instruction by instruction while Java is a fast-interpreted language. Java has also been designed so that the run-time system can optimize their performance by compiling byte code to native machine code on the fly (execute immediately after compilation). Many companies are a working on a native - machine-architecture compiler for Java. These will produce an executable code that does not require a separate interpreter, and that is indistinguishable in speed from C++.

Dynamic and Extensible IX

Java is also dynamic language. Java is capable of dynamically linking in new class, libraries methods and objects. Java can also establish the type of class through the query building it possible to either dynamically link or abort the program, depending on the reply Java program is support functions written in other language such as known as native method.

CONCLUSIONS

In this paper, I have studied the of Java and also why Java is popular language now days. Java an Object Oriented, general-purpose programming language. After its birth it became popular because of many reasons like security, robust and multithreadedness but mainly because of its portable and platform independent. Security is a multifaceted feature of the Java platform. There are a number of facilities within Java that allow you to write a Java application that implements a particular security policy, and this book will focus on each of those facilities in turn. The logic and magic behind its platform independence is "byte code".

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